

## Claims

What is Claimed is:

1. A method of checking authenticity of a first communication subscriber in a communication network having first and second communication subscribers, comprising:  
forming a first error detection datum at the first communication subscriber ;  
transmitting an information item concerning a random datum from the first communication subscriber to the second communication subscriber;  
forming a second error detection datum of the second communication subscriber;  
forming an error information item at the second communication subscriber, using the second error detection datum and the information item concerning the random datum ;  
transmitting the error information item from the second communication subscriber to the first communication subscriber; and  
checking the first and second error detection data at the first communication subscriber using the error information item.
2. The method according to claim 1, further comprising:  
forming authentication data using the first error detection datum and the information item concerning the random datum ; and  
transmitting the authentication data from the first communication subscriber to the second communication subscriber.
3. The method according to claim 1, further comprising:  
reproducing the first error detection datum at the second communication subscriber; and  
checking authenticity of the first communication subscriber at the second communication subscriber based on whether the first error detection datum reproduced by the second communication subscriber lies in a predetermined range .
4. The method according to claim 3, wherein checking the authenticity comprises:  
determining a difference between the first error detection datum formed by the first communication subscriber and the first error detection datum reproduced by the second communication subscriber; and  
forming a sequence error, when the difference does not lie in the predetermined range.

5. The method according to claim 4, wherein  
the sequence error contains the information item concerning the random datum and the second error detection datum, and  
the sequence error is transmitted from the second communication subscriber to the first communication subscriber.

6. The method according to claim 5, wherein  
the sequence error is verified at the first communication subscriber, and  
a value of the first error detection datum is changed at the first communication subscriber in dependence on a value of the second error detection datum.

7. The method according to claim 6, wherein  
the method further comprises determining authentication data using the information item concerning the random datum and the first error detection datum, as changed at the first communication subscriber, and  
the authentication data is matched to the information item concerning the random datum.

8. The method according to claim 1, second error detection data is a sequential number.

9. The method according to claim 1, wherein the information item concerning the random datum is a random number.

10. The method according to claim 1, wherein the first communication subscriber is a service provider and/or the second communication subscriber is a service user in the communication network.

11. The method according to claim 9, wherein the service provider is a mobile radio operator of a mobile radio system and/or the service user is a mobile telephone.

12. The method according to claim 1, further comprising changing a value of the first error detection datum to resynchronize the first and the second error detection data.

14. The method according to claim 2, further comprising:  
reproducing the first error detection datum at the second communication subscriber; and  
checking authenticity of the first communication subscriber at the second communication subscriber based on whether the first error detection datum reproduced by the second communication subscriber lies in a predetermined range .

15. The method according to claim 14, wherein checking the authenticity comprises:  
determining a difference between the first error detection datum formed by the first communication subscriber and the first error detection datum reproduced by the second communication subscriber; and  
forming a sequence error, when the difference does not lie in the predetermined range.

16. The method according to claim 15, wherein  
the sequence error contains the information item concerning the random datum and the second error detection datum, and  
the sequence error is transmitted from the second communication subscriber to the first communication subscriber.

17. The method according to claim 16, wherein  
the sequence error is verified at the first communication subscriber, and  
a value of the first error detection datum is changed at the first communication subscriber in dependence on a value of the second error detection datum.

18. The method according to claim 17, wherein  
the method further comprises determining authentication data using the information item concerning the random datum and the first error detection datum, as changed at the first communication subscriber, and  
the authentication data is matched to the information concerning the random datum.

19. The method according to claim 18, wherein the first and second error detection data are sequential numbers.

20. The method according to claim 19, wherein the information item concerning the random datum is a random number.

21. The method according to claim 20, wherein the first communication subscriber is a service provider and the second communication subscriber is a service user in the communication network.

22. The method according to claim 21, wherein the service provider is a mobile radio operator of a mobile radio system and the service user is a mobile telephone.

23. The method according to claim 22, further comprising changing a value of the first error detection datum to resynchronize the first and the second error detection data.

24. A system to check authenticity in a communication network, comprising:  
a first communication subscriber to form a first error detection datum, and to transmit an information item concerning a random datum;

a second communication subscriber to receive the information item concerning a random datum from the first communication subscriber, to form a second error detection datum of the second communication subscriber, to form an error information item using the information item concerning the random datum and the second error detection datum and to transmit the error information item to the first communication subscriber, for the first communication subscriber to check the second error detection datum and the first error detection datum using the error information item.

25. A system for checking authenticity in a communication network having first and second communication subscribers, comprising:

means for forming a first error detection datum for the first communication subscriber;

means for transmitting an information item concerning a random datum, from the first communication subscriber to the second communication subscriber;

means for forming a second error detection datum for the second communication subscriber;

means for forming an error information item using the information item concerning the random datum and the second error detection datum;

means for transmitting the error information item from the second communication subscriber to the first communication subscriber; and

means for checking the first and second error detection data at the first communication subscriber, using the error information item.